

A NEW NEARCTIC SPECIES OF FORCIPOMYIA (FORCIPOMYIA)
DESCRIBED IN ALL STAGES (DIPTERA: CERATOPOGONIDAE)

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ABSTRACT—*Forcipomyia* (*Forcipomyia*) **bystraki**, new species from North America, is described and illustrated in all stages. The species was reared from wet moss and from under bark of decaying trees.

We are taking this opportunity to describe a new, apparently common biting midge of the genus *Forcipomyia* from eastern North America because we have recently received specimens of the immature stages, which are of considerable taxonomic importance in this genus. For an explanation of terms dealing with immature stages see Saunders (1924) and Chan and LeRoux (1965). Terminology dealing with adults is discussed in Chan and LeRoux (1965) and Dow and Wirth (1972). Types are in the U.S. National Museum in Washington, D.C. Paratypes will be deposited in the Canadian National Collection, Ottawa; the California Academy of Sciences, San Francisco; and the British Museum (Natural History), London. We are indebted to Mrs. Ethel Grogan for preparing the illustrations.

It is a pleasure to name this new species in honor of our good friend and coworker Paul G. Bystrak, who has successfully reared it, and in recognition of his contributions to the study of the genus *Forcipomyia*.

Forcipomyia (*Forcipomyia*) *bystraki* Grogan and Wirth, new species

Fig. 1-2

Diagnosis: Large species with pale yellow legs, distal $\frac{1}{2}$ of hind femur and narrow band on distal portion of hind tibia brown; females with well-developed mandibular teeth and small, ovoid spermathecae; males with pale 9th segment, telomere pale with darkened tip, basimere contrasting dark brown; claspettes fused on proximal $\frac{1}{4}$. Larvae can be distinguished from all other described *Forcipomyia* (*Forcipomyia*) by their setose, broadly hastate *a* hairs with serrated edges; pupae with small respiratory organ bearing 6 spiracular papillae and a small spine on apex of anterior side.

Holotype: Adult female. Wing length 1.16 mm; breadth 0.48 mm.

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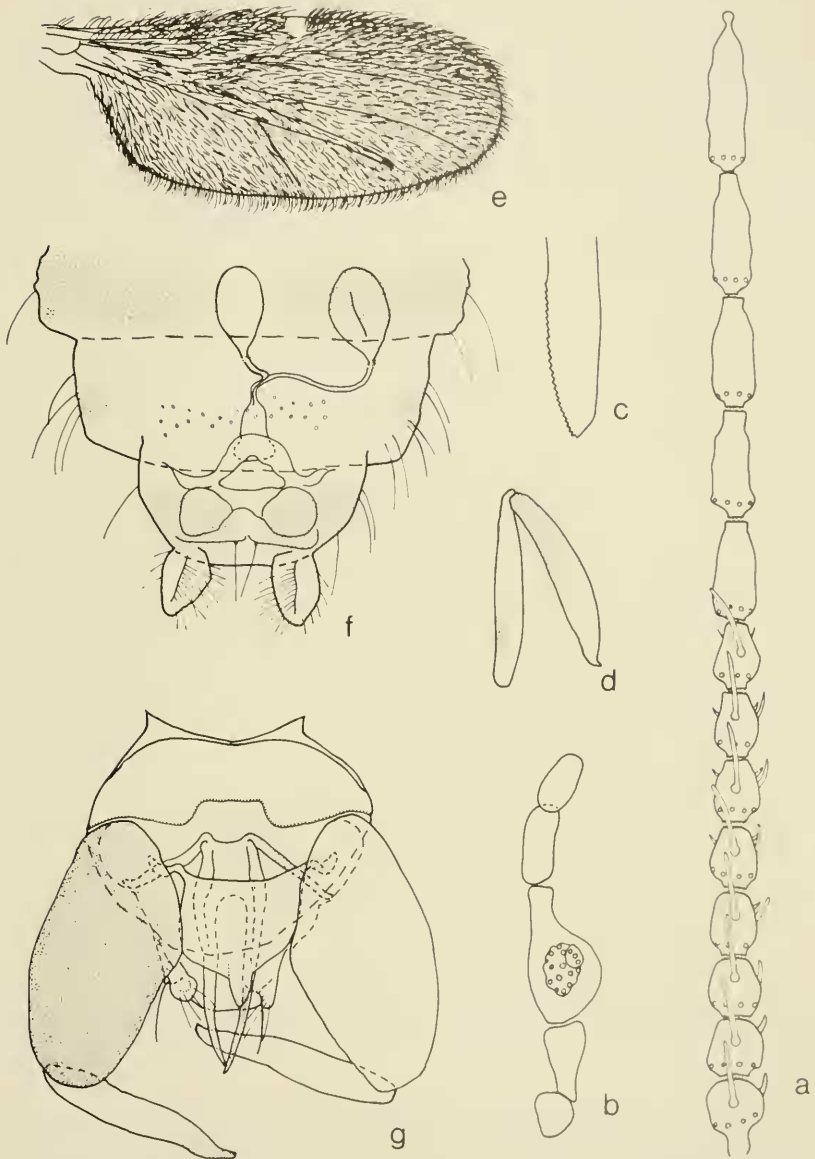


Fig. 1. *Forcipomyia bystraki*. a-f, female. a, antenna. b, palpus. c, mandible. d, hind femur and tibia. e, wing. f, genitalia. g, male genitalia.

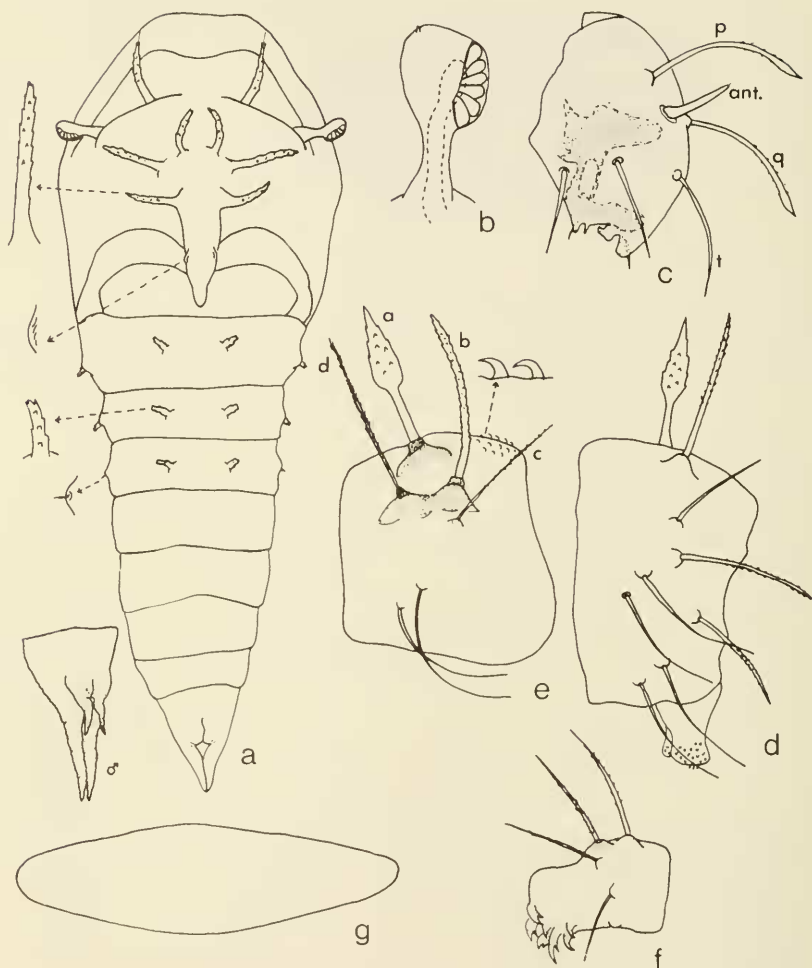


Fig. 2. *Forcipomyia bystraki*. a, pupa. b, pupal respiratory organ. c, larval head. d, larval prothoracic segment. e, larval mid-abdominal segment. f, larval caudal segment. g, egg.

Head: Brown; antenna and palpus lighter brown. Eyes bare; in broad contact. Antenna (fig. 1a) with proximal 8 flagellar segments globose, possessing multiple sensoria; distal 5 segments elongate, lacking sensoria; apical segment with distinct apical papilla; flagellar segments with lengths in proportion of 10-8-8-8-8-9-9-15-16-17-18-24; antennal ratio 1.30. Palpus (fig. 1b) with segments in proportion of 12-21-37-21-17; 3rd segment greatly expanded proximally with distinct deep pit bearing numerous minute, hyaline sensilla; palpal ratio 2.25. Mandible (fig. 1c) heavily sclerotized with about 30 sclerotized teeth.

Thorax: Brown; mesonotum brown with long brown setae. Legs pale yellow; distal half of hind femur and narrow band on distal portion of hind tibia brown (fig. 1d); femora and tibiae with long setae; hind tarsal ratio 0.90; 5th tarsomeres with well-developed fringed empodia and greatly curved claws. Wing (fig. 1e) about $2.5 \times$ longer than broad; unicolorous brown with a small yellowish anterior spot at tip of costa; covered with macrotrichia, most dense on and proximal to radial sector; costal ratio 0.44. Halter pale.

Abdomen: Brown; covered with long setae; segmental membranes pale giving abdomen a banded appearance. Genitalia as in fig. 1f: spermathecae ovoid, subequal with short necks, ducts hyaline and joining posteriorly where they enter the hyaline bell-shaped bursa copulatrix; genital sclerotization U-shaped with recurved tips.

Allotype: Adult male. Similar to female holotype with the usual sexual differences and the following other differences: mandible more slender, apex only with small slender teeth; thorax darker brown; hind leg pattern nearly identical; claws with slightly bifid tips; wing more slender.

Genitalia: As in fig. 1g. Ninth segment pale, color contrasting with brown basimere; sternum about $1.7 \times$ broader than long with a truncate caudomedian notch, base concave; 9th tergum tapered distally, distal portion brownish. Basimere dark brown, nearly straight, about $2 \times$ as long as broad; telomere pale with darkened tip, nearly straight, about $0.83 \times$ the length of basimere, tapered slightly distally. Aedeagus lightly sclerotized, shield-shaped; distal portion with elongate, pointed, median process; basal arm short, recurved and anteriorly directed. Claspettes fused on proximal $\frac{1}{4}$, lightly sclerotized; distal portion broadly forked, each distal process a slender rod slightly tapering distally with pointed tip; basal apodeme slender, tip slightly recurved.

Variation: *Females*: Wing length 1.21 (1.10–1.35, $n = 10$) mm; breadth 0.50 (0.45–0.55, $n = 10$) mm. Costal ratio 0.46 (0.44–0.49, $n = 10$). Antennal ratio 1.35 (1.10–1.51, $n = 10$). Palpal ratio 2.34 (1.89–2.66, $n = 10$). Hind tarsal ratio 0.86 (0.78–0.92, $n = 10$). Some females in the type-series lack the narrow brown band on the hind tibia. *Males*: Some males in the type-series have a broader brown band on the hind tibia than does the allotype.

Pupa (fig. 2a): Retains larval exuviae. Thorax with 4 pairs of setose, cuticular, dorsal spines, the anterior pair each with a terminal seta; and a pair of small, rounded, posterior tubercles. Respiratory organ (fig. 2b) small, with 6 lateral spiracular papillae, and a small spine on apex of anterior side. Abdominal segments 2–4 each with a pair of blunt, setose, dorsal spines; segments 2–3 each with a pair of blunt, setose lateral spines; segment 4 with a pair of short, slender, lateral spines; remainder of abdomen bare. Terminal processes appressed in male and female.

Larva (4th instar): Body light brown, lightly sclerotized. Head (fig. 2c) with very heavily sclerotized internal structures; antenna apparently with 3 segments; *p* hair long, distal portion setose, tip slightly hastate; *q* hair identical to *p* hair; *t* hair long, slender. Prothoracic segment (fig. 2d) with pseudopod split for nearly entire length and with 3 medioventral sclerotized hooks on each side: *a* hair long, setose, broadly hastate with serrated edges; *b* hair longer than *a* hair, long, broad, setose; *c* hair shorter than *b* hair, slender; *d* hair similar to *b* hair. Surface of midabdominal segments (fig. 2e) with short, recurved setae; *a* and *b* hairs like those on prothoracic segment; *c* hair shorter than *b* hair, slender, setose;

d hair longer, broader than *c* hair, setose, basal papilla fused to basal papilla of *b* hair. Caudal segment (fig. 2f) small; anal blood gills short, rounded; anal pseudopod with double row of sclerotized hooks, 8 on each side.

Egg (fig. 2g): Ellipsoid, measuring 0.26 by 0.08 mm.

Biology: This species has been reared from under bark of tulip poplar and black oak, and from moss, by P. G. Bystrak and from under bark of a stump by W. W. Wirth.

Distribution: Common in the eastern United States from Michigan and Maryland south to Arizona and Florida.

Types: Holotype, ♀; allotype, ♂; on slides with their associated larval and pupal exuviae, reared from wet moss by P. G. Bystrak, Headwaters, Highland County, Virginia, June 1969 (Type no. 72211, USNM). Topotypes, 4 ♂♂, collected with holotype; other paratypes, 370 ♀♀, 136 ♂♂, 7 larvae, as follows:

FLORIDA: Alachua Co., Gainesville, Chantilly Acres, 18 April–21 September 1967, F. S. Blanton, light trap, 144 ♀♀, 46 ♂♂. Baker Co., Olustee, July 1971, F. S. Blanton, 1 ♀. Charlotte Co., Englewood Beach, 16 June 1960, W. Jernigan, 1 ♂. Franklin Co., Sumatra, Right's Lake, April 1973, G. B. Fairchild, 2 ♂♂. Giles Co., 15 June 1960, G. K. Hicks, 1 ♀. Hardee Co., Ona, July 1970, E. Irons, 1 ♀. Highlands Co., Sebring, Highlands Hammock St. Pk., 15 April 1970, W. W. Wirth, 1 ♀. Hillsborough Co., Tampa, March 1967, Taylor, 4 ♀♀, 1 ♂; Harris Swamp, March–April 1967, 10 ♀♀, 5 ♂♂. Indian River Co., Vero Beach, Ent. Res. Cntr., April 1956–May 1960, 31 ♀♀, 12 ♂♂. Jackson Co., Florida Caverns St. Pk., 26 May 1973, W. W. Wirth, 6 ♂♂. Jefferson Co., Monticello, September–October 1969, W. H. Whitcomb, 8 ♀♀, 2 ♂♂. Lee Co., Sanibel Island, 11 May 1973, W. W. Wirth, 1 ♀. Leon Co., 3 mi N Tallahassee, May 1970, F. S. Blanton, 3 ♀♀, 4 ♂♂. Levy Co., Camp Williams, July 1960, G. K. Hicks, 1 ♀. Liberty Co., Torreya St. Pk., 20 May 1966, H. V. Weems, 8 ♀♀, 5 ♂♂; 15 April–30 June 1967, F. S. Blanton, 6 ♀♀, 6 ♂♂; 22 April 1967, W. W. Wirth, 1 ♀. Marion Co., Juniper Springs, 28 April 1970, W. W. Wirth, 1 ♂. Orange Co., Lake Magnolia Pk., 6 August 1970, E. Irons, 1 ♂; Orlando, 19 July 1969, G. M. Stokes, 2 ♀♀; Rock Springs, 21 April 1970, W. W. Wirth, 9 ♀♀. Putnam Co., Lon's Lake, May–September 1971, F. S. Blanton, 19 ♀♀, 5 ♂♂; Red Water Lake, 27 May 1967, F. S. Blanton, 2 ♀♀; Welaka, 9 April 1964, H. A. Denmark, 3 ♀♀. Sarasota Co., Myakka River St. Pk., 21 May 1973, W. W. Wirth, 2 ♀♀, 2 ♂♂. ILLINOIS: Jersey Co., Grafton, 6 May 1973, reared from tree hole, W. E. Snow, 1 ♂. KANSAS: Douglas Co., Lawrence, May–August 1956, A. R. Barr, 15 ♀♀, 3 ♂♂. Riley Co., August–September 1964, N. Marston, 11 ♀♀; Manhattan, 15 June 1958, W. W. Young, 2 ♀♀. MARYLAND: Anne Arundel Co., Galesville, Java Farms, Muddy Creek, reared from black oak, 4 January—emerged 6 March 1970, P. G. Bystrak, 1 ♀; Odenton, Towser's Branch, reared from tulip poplar, 22 February—emerged 6 March 1970, P. G. Bystrak, 2 ♀♀, 2 ♂♂. Cecil Co., Calvert, under bark of log, 29 March 1969, J. G. Connell, 7 larvae. Montgomery Co., Forest Glen, 13 July–29 August 1956, 15 April–5 June 1967, W. W. Wirth, 15 ♀♀, 1 ♂. Prince Georges Co., College Park, reared from tulip poplar, 26 March—emerged 2 April 1970, P. G. Bystrak, 1 ♀. Worcester

Co., Shad Landing St. Pk., 6 October 1973, W. L. Grogan, Jr., 1♀, 3♂♂; Snow Hill, 25 June 1966, W. H. Anderson, 1♀. MICHIGAN: Cheboygan Co., Douglas Lake, 15–29 July 1954, 16 July–8 August 1959, R. W. Williams, 8♀♀, 2♂♂. MISSISSIPPI: Washington Co., October 1962, R. H. Roberts, 1♀. MISSOURI: Jackson Co., Independence, April–August 1957, K. Shain, 1♀, 4♂♂. NORTH CAROLINA: Macon Co., Highlands, July 1965, P. M. Marsh, 1♀. VIRGINIA: Fairfax Co., Falls Church, Holmes Run, 19 May 1958–21 September 1961, W. W. Wirth, 49♀♀, 21♂♂; 10 April 1960, reared from under bark of stump, W. W. Wirth, 1♀. Smyth Co., Saltville, salt marsh, 4 May 1962, W. W. Wirth, 1♀. WEST VIRGINIA: Hardy Co., Lost River St. Pk., 8–14 July 1963, K. V. Krombein, 2♀♀.

The following specimens were examined but are not designated as paratypes: ARIZONA: Cochise Co., Chiricahua Nat. Mon., 1 June 1967, C. W. Sabrosky, 6♀♀, 9♂♂; Cochise Stronghold, Dragoon Mts., 16 July 1958, C. W. O'Brien, 6♂♂. Pima Co., Sabino Canyon, Santa Catalina Mts., 7 July 1960, Johnson and Werner, 1♀; Sycamore Canyon, Ruby, 22 May 1954, G. D. Butler, 1♀, 4♂♂. NEBRASKA: Otoe Co., Dunbar, 6 July 1962, W. W. Wirth, 9♀♀. TEXAS: Aransas Co., Aransas Wildlife Refuge, 22 April 1956, W. W. Wirth and R. H. Jones, 3♀♀, 2♂♂. Kerr Co., Kerrville, 21 March 1955, W. W. Wirth, 9♀♀, 1♂.

Discussion: *Forcipomyia bystraki* belongs to a small group of species in the subgenus *Forcipomyia* characterized by well-developed mandibular teeth. *Forcipomyia townesi* Wirth (1952) from the western and northern states is apparently closely allied to *bystraki*, differing by having much larger, oval, female spermathecae, the legs extensively brownish with the hind femur brown on more than the distal ½ gradually shading to a pale proximal portion, and the male 9th segment dark in color. The male allotype of *F. townesi* figured by Wirth (1952) was misidentified and belongs to another, as yet undetermined species; the genitalia of *F. townesi* are almost identical with those of *F. bystraki*, with the difference noted above. We have identified *F. townesi* from USNM specimens from California, Oregon, Utah, Ontario, New York, and Florida.

REFERENCES

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